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ABSTRACT

Microcomputers need to be introduced and effectively managed in academic organizations, where compatibility becomes an important issue as users wish to communicate with other users via computer. The need to standardize hardware and software thus becomes an important issue. The first step in selecting a microcomputer standard is the selection of a search committee to determine the specific set of microcomputer needs on the campus. This committee should represent and consider the interests of four areas of concern: administrative, end user, technical, and training. In the second step, the selection of software, the end users, technical staff, and trainers need to concentrate on the best fit in the campus environment. Issues to be considered include flexibility, future needs, DOS compatibility, types of training to be done, and the reputation of the vendor. Technical representatives on the committee will play a major role in the third phase, the selection of hardware. Technical factors to be considered will range from processor speed and display clarity to possibilities for upgrading the system. Ways to facilitate the fourth phase, implementation, range from getting end users involved in pre-installation planning, through running computer systems parallel with manual and exiting automated systems in the beginning and installing microcomputers in phases wherever possible, to taking ergonomic considerations into account when planning workstations. (BBM)

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Selecting the "Right" Microcomputer

by Susan Staples Smith

In this first of a two-part article, Susan Smith, Senior Applications Analyst in the Division of Computer Services at the Harvard Business School, takes us through the first few steps of selecting a microcomputer standard for your campus. Part two will appear in next month's issue.

You know you have to take a stand. No longer can you look the other way when a microcomputer disguised as an expensive calculator makes its way through the budget and onto the desktops of your faculty and administrators. Or maybe you have already been asked to support an assortment of hardware configurations and software packages. Your personal computing support people, if you have such a group, is getting burned out. You know you need to take a position on supporting microcomputers at your school. You need to decide what to support, when and where. You want to avoid the support nightmare that has already begun. But where do you start?

Like any new technology, microcomputers need to be introduced and effectively managed in academic organizations. An individual does not need to be concerned with compatible media, hardware or software, but when these individuals work together in a college or university the need to standardize becomes important. Your microcomputer users will want to communicate with the mainframe, send and receive messages via some form of electronic mail, and exchange documents in electronic form with colleagues, secretaries and perhaps, a word processing center. If hardware or software incompatibility prevents this or makes it unduly difficult, the usefulness of the microcomputer as a tool is reduced. Standards also make good economic sense. Volume purchase agreements, faster repairs, lower training costs, and time saved all translate into significant dollars. Microcomputers are following the path of the telephone. Institutions are paying for the microcomputer on the desks of administrators, faculty members and secretaries just as they pay for the office telephone. With users accessing the host becoming more common along with electronic mail applications, the cost and support of this powerful office tool is becoming more and more the responsibility of a microcomputer support group.

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"It is difficult to see how the coming upheaval in computer centres, as their role changes from the provision of computer power to that of provision of assistance, can take place gracefully. The problem of reorientation seems overwhelming."

E. B. James
Imperial College, London
"Small is Beautiful: the Next Ten Years in University Computing"
University Computing
Spring 1986

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The Search Committee. Of course, before you can develop standards, you need to define the current and potential needs of all the microcomputer audiences at your institution. Once you know your needs, you can select the appropriate software that in turn dictates the hardware configuration. Start then by creating a committee that will determine the specific set of microcomputing needs on your campus. This is the stage where you will want to go slow to go fast later on. Choose the members of this committee carefully. It will take diverse talent to do the job well. Concentrate on representing four areas of concern found on any campus: administrative, end user, technical, and training.

The representative(s) from the administration should bring some thought of budgets and the management of microcomputer installations. They should be aware of the long range plans of the school and how introducing microcomputers will affect these. For example, the committee would not recommend installing dedicated electrical circuits in a building if they knew it was to be renovated shortly or torn down. The administrative members of this team should represent the philosophy of the school and keep the search committee on track and within the bounds of practicality. They should be the local experts on how to manage projects well at your institution.

An individual does not need to be concerned with compatible media, hardware or software, but when these individuals work together in a college or university the need to standardize becomes important.

The end user representative(s) are critical to the success of the committee. They should be individuals who are tuned into what people on campus are currently doing with microcomputers and where the campus wants to be five years into the future. They should be individuals with substantial personal computing experience and have strong analytical skills.

On the technical side, your committee will require competent personal computing technical specialists. If you don't have this expertise on staff, you might have to look outside for a consultant. These individuals should be able to work out communications requirements with your mainframe and minicomputers and be aware of industry trends to guide you in the right direction. They are the individuals familiar with the brand names, vendor track records, and how to find the best technology to meet user needs.

Finally, training concerns need to be represented on the committee. Without an eye towards the ease of use and implementation of the software/hardware, the microcomputer ultimately selected will not be used as envisioned. The trainers play a key role in the success of any installation.

Once it is assembled, the search committee should concentrate on needs assessment. Interviews conducted with all segments of the community should answer the following questions. Where can microcomputers be of most benefit to the community? What are the success stories and failures already present on the campus? What is the wish list of your community? What are similar institutions doing in the field of microcomputing? This is a time-consuming phase of your search. It is critical, however, and if done well will make future phases of the project move along more quickly. It is the set of needs that will dictate appropriate software and the software is what dictates everything else: type of hardware, training, documentation, levels of support and implementation schedules.

As mentioned before, it is preferable to use internal resources for this microcomputer search committee. Staff members are more cognizant of your particular environment and know the most effective ways to sell and implement projects. When using internal staff is not possible, hire the outside consultant(s) to define the needs of your campus. What a consultant lacks in knowledge of your community may be offset by a greater objectivity, and probably by a time savings, if not cost.

Software Selection. Once you have your needs defined, you are ready to move to the next phase of selecting your software. Here the administrative role is not as great as it was in the first phase. Now the end users, technical staff and trainers concentrate on the best fit in your campus environment. Most likely word processing is a major application and your requirements may be quite specific such as a need for Greek symbols, high letter-quality print, user-customized spell checkers, etc. The team will have to study software offerings carefully and evaluate their features, ease of use, documentation, and training requirements. It will take time to find the software package which best meets the majority of your needs in each application area. This is not to say that the end users themselves will not discover packages on their own, but your personal computer support group should provide software guidance selection in each application area and stand ready to provide support.

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Ideally, you want software that uses the same command structure and conventions across several applications including word processing, graphics, spreadsheets, communications and data base management. This makes training and support a lot more effective. End users are more willing to learn new packages if there is something familiar about them. Flexibility is key also. Can a thesaurus or sort utility from a different developer be added? How well can the software selected accept data keyed with other software?

You should evaluate software in terms of the future as well. Is the vendor going to be around? Have new releases been planned? Do you think the software in question can adapt to a changing marketplace with more friendly user interfaces or touch screens or be compatible with a mouse? And what about copy protection? Does the presence or lack of copy protection fit with your environment?

One of the major issues your committee will need to decide is how important it is that this software be DOS compatible. Do you want to follow the majority and be assured that there is third party documentation and training available or maybe that the software will enjoy long term support (new releases, errors corrected) because of a large installed base? Some IBM clones run only 75% of the software available for the IBM-PC family. What level of IBM software compatibility do you need?

Once you know your needs, you can select the appropriate software that in turn dictates the hardware configuration.... This is the stage where you will want to go slow to go fast later on.

Remember to make your software selection with training in mind. Evaluate the five types of training that might be available for this product. (1) Can you afford an in-house trainer who knows the needs of the school and is always there to provide live instruction and telephone support? (2) Is the vendor able to provide training onsite or at a training center? (3) What is the third party training market like for this software? (4) Are there books, CBT courses, audio tapes or video cassettes your campus can take advantage of? (5) Is this product popular enough to be written about in computer publications? A lot can be learned from articles about software programs and applications.

The reputation of the vendor is extremely important when selecting software. Your committee should check references preferably from other educational institutions. They should call the technical support hot line and evaluate the response. Of course, they might have to borrow someone else's access number for that test. They should review the past performance of the company in correcting errors and know the developer's future direction as much as possible. Obtaining accurate numbers of customers and reading reviews by *Software Digest*, *Datapro*, *Data Decisions*, *Infoworld* and other software rating publications are all a part of an effective evaluation process. ■

In next month's issue, Susan will go on to discuss hardware selection and implementation issues.

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... And More

Selecting the "Right" Microcomputer

Part II

by Susan Staples Smith

In this second of a two-part article, Susan Staples Smith, Senior Applications Analyst in the Division of Computer Services at Harvard Business School, takes us through the remaining steps of selecting a microcomputer standard for your campus. In last month's issue, Susan discussed the role of the microcomputer search committee, and the process of software selection.

Once you have selected the software products to make your microcomputer installations work, it is time to concentrate on the hardware issues. During this phase, your technical representatives on the search committee will play a major role. Such things as processor speed, display clarity, keyboard layout and feel, type of media, storage capability and footprint size (the amount of desktop space required) need to be evaluated. An overriding concern will be the quality of the upgrade path. Can the hardware be easily modified to meet future needs? Today a minimum configuration consists of one diskette drive, one hard disk (20MB) and 512K. A high density diskette drive can probably be replaced by a more useful 3 1/2" drive and the cost of memory has gone down to make the old minimum of 256K as shortsighted as 64K was four years ago. Certainly a three- or five-year life span is desirable while one or two years of service is not. Does the vendor promote opening the system box for self-repair or upgrade? Is there a host of third-party cards (internal modems, memory, hardcards, etc.) available for your selection? If not, do you find the closed box concept workable and is the vendor quick to provide repairs and upgrades at reasonable cost? Is a bundled system just right for your needs even though it may not be as flexible as software and hardware purchased separately?

Don't forget to take a look at the hardware documentation. It is as important as your software user guides. Are there descriptions of how to connect peripherals, tips on maintenance, and warnings on what actions to avoid to keep your equipment running well? Also, what is the level of the documentation? Is it written only for the experienced "techie" or can a novice read it and understand more about his or her new system?

As with software products, you will want to assess the stability of the hardware vendor. The industry has settled down in the past two years, but there are still manufacturers who will not enjoy success indefinitely. Do they provide good technical support? Is there an on-site representative assigned to your account? Is there a local representative at all? How good is their telephone support? Don't forget to actually call their references. Ask for a complete client list so you don't just call the ones they recommend. How many of their units are in service? What is the warranty period and what would it cost to extend it? How costly are their maintenance contracts?

One-stop shopping has benefits for microcomputer purchasers as well. If one or more of your software needs and your hardware needs can be satisfied by the same vendor, then some of your support work is reduced. You can more safely assume that the software has already been tested and will work well on the hardware for which it was designed. You also won't have to spend time communicating with two vendors who claim the desired result is elusive because of some failure in the other's product.

Again, what level of IBM compatibility, if any, do you need for your hardware? Some compatibles take IBM cards, but not IBM boards. Among clones, even keyboard layouts can differ dramatically.

There are several ways to reduce hardware costs. Some schools are buying system units from obscure manufacturers (known as Brand X), often through mail order houses. These schools generally employ knowledgeable technical people who can put together a workable configuration. This mix-and-match practice can work, but is open to risk. Instead of one manufacturer's reliability, you are in the position of being concerned over the reliability of several. In addition, servicing the units becomes more complicated as components as simple as power cords are probably different.

Volume buying is another way to reduce costs. Check volume purchases not only with the manufacturer, but also with retail stores. Often the retail computer store can beat the original manufacturer's price. It sounds crazy, but it is true.

Don't spend more money on maintenance than you need to. On-site maintenance sounds like a necessity, but you may really need only a carry-in service. Your facilities people can do the delivery and pickup. Turnaround is usually only a day or two. Often the user can do without a computer for a short period of time. A good short-term solution is to hand them a portable for the repair interim. Some institutions have solved the maintenance problem by buying ten systems for every nine needed. The malfunctioning unit is replaced by a spare that is then repaired on a less costly, non-emergency basis.

Implementation Issues

Keeping costs as low as possible is easier when standards are in effect. It is difficult to substitute a spare or take advantage of a volume discount, or keep full-time trainers on staff if the microcomputing philosophy on campus is laissez-faire. Granted, it is tough to balance the productivity of individuals against the benefits of standardization for the community, but with a little luck, your microcomputer configuration will be flexible enough to accommodate a variety of microcomputing needs and talents. There will always be a need to accommodate unique applications, but for the majority of the work, standards make sense.

Be careful about assuming that everyone agrees that computers are great. Computers mean change. People of all ages, skill levels and professions do not like change. Some handle it better than others, but all need to be prepared for change. The closer their expectations are to reality, the more successful your microcomputer installation will be. Get the end users involved in the pre-installation planning. Ask their advice on things like scheduling, renovating, training, and installation. If they feel some sort of ownership, some stake in making the installation work, then it will. Avoid surprises. Let your end users know when things are going to happen and why. Be realistic when estimating how long it will take to learn an application. Don't leave them without any recourse during the first few weeks. Run in parallel initially with manual or existing automated systems. Install the microcomputers in phases whenever possible. Phase in new applications too, one by one.

Plan ahead to answer your critics.... Find a way to highlight improvements in the quality of the product and in the satisfaction levels of your users. Have you removed some of the drudgery from their lives?

Once you have an installed microcomputer base, you will want to manage your scarce support resources based on priorities. Those people who are experienced or particularly competent can be left alone. If they want help, they will ask for it. The group that needs help and will wait for it should receive your attention only as available. The group you want to concentrate on are those people anxious to get started with microcomputers. That group is the most likely to make mistakes and encounter frustration. Those are the individuals who generate bad press affecting subsequent installations. Advise your staff to support this group first.

The implementation process can be badly affected not only by poor advance planning, but by insufficient budgets. The cost of software and hardware is just the beginning. There is a cost associated with learning to use the microcomputer effectively. There are the continuous support costs of training, maintenance, and providing software and hardware upgrades.

There are ergonomic costs associated with microcomputers also. Often these are completely overlooked. Making the mistake of poor or no ergonomic planning will adversely affect the success of your installations. Evaluate, budget and install such items as glare screens, printer sound covers, computer tables, task lamps, copy holders, power strips, and cans of static spray. Carefully consider the height of workstation surfaces, office lighting and placement of the microcomputer. If an end user is comfortable at the workstation, s/he will be more likely to use the microcomputer frequently and consider the installation a success. On the other hand, if the user experiences eye strain because of harsh lighting or glare or has numb wrists because the work surface is too high, the microcomputer itself will be seen as the cause, and the success of the installation will be less than if the microcomputer had been placed in an ergonomic setting.

If you are worried about underutilization and think a microcomputer should be shared to receive optimum use, don't place it on someone's desk. Once it is seen as a dedicated unit, it cannot be removed until that individual leaves. Other staff members are naturally reluctant to use a tool which is on someone else's work surface. Provide for a separate work area devoted to working on the computer. Make sure there is a telephone nearby so people can forward their calls. You might have a pool of microcomputers with a range of printers and/or plotters available for those individuals who cannot justify dedicated units. Plan for privacy and avoid the fishbowl concept where every passerby feels the need to stop and comment on how well the novice is taking to computing. There is nothing so demoralizing as having someone staring over your shoulder when you are trying to learn a new application.

Finally, plan ahead to answer your critics. Document how things were being done before the microcomputers were installed, then follow up six months and then every year into the future and report on your success. Don't forget to include the new jobs that were not being done before or the additional staff hiring that was avoided. Find a way to highlight improvements in the quality of the product and in the satisfaction levels of your users. Have you removed some of the drudgery from their professional lives? Monitoring your installations provides the added benefit of helping you plan for the future and the chance to correct mistakes. The post-installation evaluation will be worth the time required. Publish your results and share them with the community you have helped to change. Remember they are very much part of the process since the microcomputer is their personal tool. ■